

CLAIMS

We claim:

1. A pressure relief and topping valve for use in exhausting over-pressure in an inflatable device as well as topping off or inflating the inflatable device, the valve comprising:

- a valve body having a fluid passage therein with an internal shoulder;
- a first poppet having a seal seated therein and biased against the shoulder by a first spring, the first poppet and seal having an aperture therein;
- a second poppet biased into the aperture by a second spring.

2. The pressure relief and topping valve of claim 1 wherein the second poppet is biased against the seal in the aperture.

3. The pressure relief and topping valve of claim 1 wherein the seal includes a first face that seats within a recessed seat within the first poppet.

4. The pressure relief and topping valve of claim 3 wherein the seal includes a seating surface for sealable seating against the internal shoulder when the first poppet is biased against the shoulder.

5. The pressure relief and topping valve of claim 4 wherein the seal includes a sealing shoulder for sealable seating against the second poppet when the second poppet is biased into the aperture by the second spring.

6. The pressure relief and topping valve of claim 1 wherein the first poppet includes a recessed seat with a poppet aperture extending therein extending through the first poppet, the first poppet further including a plurality of outward stops extending from the poppet and defining air flow passages therebetween.

7. The pressure relief and topping valve of claim 6 wherein the first spring is positioned between the first poppet and a first spring retainer for biasing the first poppet against the shoulder.

8. The pressure relief and topping valve of claim 7 wherein the second poppet includes a stem extending to a head with a neck therebetween, where the poppet seats within the poppet aperture and selectively against the seal.

9. The pressure relief and topping valve of claim 8 wherein the second spring is positioned between the first poppet and a second spring retainer for biasing the second poppet against the seal.

10. A pressure relief and topping valve for use in exhausting over-pressure in an inflatable device as well as topping off or inflating the inflatable device, the valve comprising:

- a valve body having a fluid passage therein with an internal shoulder;

- a first poppet having a recessed seat with a poppet aperture extending therein extending through the first poppet, the first poppet further including a plurality of outward stops extending from the poppet;

- a first spring retainer for holding the first poppet within the fluid passage;

- a first spring positioned between the first poppet and the first spring retainer for biasing the first poppet against the shoulder;

- a seal having a seal aperture therein aligned with the poppet aperture when the seal is seated in the recessed seat and selectively against the internal shoulder;

- a second poppet having a stem extending to a head with a neck therebetween, where the poppet seats within the poppet aperture and selectively against the seal;

- a second spring retainer for holding the second poppet within the fluid passage; and

- a second spring positioned between the first poppet and the second spring

retainer for biasing the second poppet against the seal.

11. The pressure relief and topping valve of claim 10 wherein the seal includes a first face that seats within a recessed seat within the first poppet.

12. The pressure relief and topping valve of claim 11 wherein the seal includes a seating surface for sealable seating against the internal shoulder when the first poppet is biased against the shoulder.

13. The pressure relief and topping valve of claim 12 wherein the seal includes a sealing shoulder for sealable seating against the second poppet when the second poppet is biased into the aperture by the second spring.

14. A method for selectively topping an inflatable device as well as allowing excess pressure to relieve from the inflatable device, the method comprising:

selectively compressing a first spring within a valve body to allow fluid flow over a seal and around a first poppet when topping of the inflatable device is desired as the first poppet with the seal sealably seated therein is unseated from against an internal shoulder within the valve body; and

selectively compressing a second spring positioned within the first poppet when excess pressure exists within the inflatable device thereby pressure relieving the inflatable device by allowing fluid flow between the seal and a second poppet as the second poppet is unseated from against the seal.